Utricularia corneliana R.W.Jobson (Lentibulariaceae), a new species from the North Kennedy district of Queensland

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Summary

Jobson, R.W. (2012). *Utricularia corneliana* R.W.Jobson, (Lentibulariaceae), a new species from the North Kennedy district of Queensland. ***Austrobaileya* 8(4): 601–607.** *Utricularia corneliana* R.W.Jobson, possibly endemic to the Minnamoolka area of northern Queensland, is described, illustrated, and differentiated from the local, and closely related African and South American species. Notes are provided on habitat and ecology, and conservation status. A key to Australian and related suspended aquatic species of *Utricularia* is provided.

Key Words: Lentibulariaceae, *Utricularia*, *Utricularia corneliana*, Australia flora, Queensland flora, new species, taxonomy, bladderwort, aquatic

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Introduction

Utricularia L. (Lentibulariceae) is a monophyletic genus of carnivorous angiosperms containing at least 219 recognised species worldwide (Taylor 1989; Gassin 1993; Lowrie 1998, 2002; Lowrie *et al.* 2008; Jobson 2012), mostly distributed in subtropical and tropical regions (Taylor 1989). In his monograph of *Utricularia*, Taylor (1989) delimited the genus into the following two subgenera: *Polypompholyx* (Lehm.) P.Taylor (three species), including two sections (*Tridentaria* P.Taylor and *Polypompholyx*), and *Utricularia* (211 species), including 35 sectional groupings. In line with the results of Jobson *et al.* (2003) the genus has since been divided into three subgenera, viz. *Polypompholyx*, *Bivalvaria* S.Kurz and *Utricularia* (Reut & Jobson 2010). Australia has *c.* 62 species (47 endemic), from the subgenera *Polypompholyx* (*c.* 40 species), *Bivalvaria* (13 species), and *Utricularia* (nine species).

Based on its suspended aquatic habit, and morphological characters such as bladder-trap form, the absence of bracteoles, the presence of basifixed bracts, and dehiscence of seed via a circumscissile suture of the capsule, the new species described here (*Utricularia corneliana,* **Figs. 1, 2A**) is considered a member of subgenus *Utricularia* section *Utricularia*. This section consists mainly of species with a fully suspended aquatic habit (Taylor 1989; Jobson *et al.* 2003). In the current paper, the distribution, habitat and morphological differences between *U. corneliana* and the other Australian suspended aquatic species, *U. aurea* Lour., *U. australis* R.Br., *U. gibba* L., *U. muelleri* Kamiénski, and *U. stellaris* L.f., are discussed. Also provided is a comparative discussion of the tropical African *U. reflexa* Oliver and *U. raynalii* P.Taylor, and the South American *U. warmingii* Kamiénski, three species that have several characters in common with *U. corneliana*.

Methods and materials

This study is based on a single collection from a single site. The specimen was divided into two spirit preserved (70% ethanol) accessions that are deposited at NSW and BRI.

The author examined suspended aquatic species of *Utricularia* (*U. aurea*, *U. australis*, *U. gibba*, *U. muelleri* and *U. stellaris*) that are deposited at BRI and NSW, finding no indication that wrongly identified *U.*

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corneliana had previously been collected.

Taxonomy

Utricularia corneliana R.W.Jobson, **species nova** *U. reflexae* similis sed limbo inferiore quam superiore majore differt. **Typus:** Australia: Queensland. North Kennedy District: S of Mt Garnet, 9 June 2011, *R.W.Jobson 1281* (holo: NSW; iso: BRI).

Small perennial, suspended aquatic herb. **Rhizoids** not present. **Stolons** filiform 5–15 cm long, 0.3–0.5 mm thick, unbranched, terete, sparsely hairy, internodes 6–8 mm long. **Leaves** numerous, circular in outline, ± amplexicaul, 3–5 mm long, slightly flattened, divided at the base into 2 primary segments, with 3 further dichotomously divided segments, the ultimate segments apically and laterally setulose. **Traps** 1 (2) per leaf, inserted in the angle between the first and second division segments, occasionally also in the third, stalked, ovoid 2–2.6 mm long, mouth lateral with two dorsal, setiform, often recurved appendages 1–2 mm long, sometime 2 or 3 simple lateral setae. Internal glands 4-armed, narrowly cylindrical up to 90 µ long, ~5 µ in diameter (**Fig. 2B**). **Inflorescence** weakly erect, emergent, 2–3 cm long, arising along the stolon from nodes at intervals of *c.* 3.5 cm. Peduncle filiform 0.5–0.6 mm thick, terete, glandular, sparsely hairy on lower portion, mostly glabrous above first bract. Scales and bracteoles absent. Bracts basifixed, amplexicaule, *c.* 1.3 mm long and 0.9 mm in diameter, apex rounded or truncate. **Flowers** 1–3 on an elongated raceme axis; pedicels filiform, erect at anthesis, deflexed in fruit 3–5.5 mm long. Lowest flower probably cleistogamous. Calyx lobes subequal, upper lobe slightly longer, ovate 3–3.5 mm long, 2–2.2 mm in diameter. **Corolla** 4.5–9.3 mm long, yellow, with few brown nerves on the basal portion of the upper lip, densely covered with fine multicellular hairs on dorsal surfaces; upper lip broadly ovate with apex rounded 4–6.5 mm long, 3.8–5.5 mm in diameter, the lower half of dorsal surface covered in hairs; lower lip limb smaller, bilobed, with a single prominent, slightly emarginate swelling at the base; spur cylindrical at base, curved, slightly flattened and tapering mid-way with apex rounded, almost as long as lower lip (when lip is flattened). **Filaments** curved *c.* 1.6 mm long. **Ovary** globose. Capsule 3.2–3.7 mm long, 2–3 mm in diameter, walls fleshy, circumscissile dehiscence. **Seeds** thinly lenticular 0.8–1 mm in diameter, with a broad, softly angled and translucent, mildly dentate edged, marginal wing of irregular testa cells with raised anticlinal walls (**Fig. 2C**). Pollen 17–18 colporate, 30 × 30 µ, *Jobson 1281* (NSW). **Fig. 1.**

***Distribution and habitat*:** *Utricularia corneliana* is thus far, only known from a single Swamp, south of Mt Garnet in the Minnamoolka area. This ephemeral swamp with a circumference of *c.* 4 km is fringed by *Eucalyptus platyphylla* F.Muell., *E.* sp., and *Melaleuca nervosa* (Lindl.) Cheel woodland (**Fig. 3**). Plants of the bladderwort were infrequent in a single corner of the swamp (*c.* 5 × 5 m), in water to *c.* 20 cm deep, with *Aldrovanda vesiculosa* L., aquatic grasses, *Eleocharis* sp., *Marsilea mutica* Mett., *Myriophyllum simulans* Orchard, *Nympoides indica* (L.) Kuntze, *Utricularia aurea*, *U. gibba* and *U. stellaris*. This black soil swamp is based upon a basalt and sand substrate at an elevation of *c.* 700 m.

***Phenology*:** Flowers and fruits recorded in June. Further research is required to determine extent of flowering season.

***Notes*:** *Utricularia corneliana* is geographically isolated and grows sympatrically with three other suspended aquatic *Utricularia* species; however, morphologically it shares most characters in common with *U. reflexa*, a variable species endemic to tropical Africa and Madagascar (Taylor 1989: fig. 194, p. 640). Molecular phylogenetic data also support this relationship (Jobson *et al.*, in prep.) and negate the possibility of a localised hybridisation event. These two species share a bright yellow corolla, similarly shaped bracts, bilobed lower corolla lip, and have traps invariably positioned at the angle between leaf segments (**Fig. 1**).

There are two, perhaps closely allied species, that also have traps positioned in the angle between leaf segments; *Utricularia raynalii* (tropical Africa) (Taylor 1989: fig. 195, p. 642), and *U. warmingii* (South America) (Taylor 1989: fig. 196, p. 644). These two species differ from *U. reflexa* and *U. corneliana* by both possessing prismatic shaped seeds; a rose pink corolla and spongy lower leaf segments in the former and a light yellow corolla and inflated peduncles in the latter (Taylor 1989).

There are several characters that differentiate *Utricularia corneliana* from *U. reflexa*, namely a lack of rhizoids in the former; an upper corolla lip that is longer than the lower, with an upper lip rear surface sparsely hairy only on the lower half (**Fig. 1**), versus an entirely hairy surface in *U. reflexa* (Taylor 1989: fig. 194, p. 640); internal trap quadrifid gland arms that are 14 versus 30 times as long as they are wide (**Fig 2B**, versus Taylor 1989: fig. C, p. 17); flat lenticular shaped seeds (*c.* 1 mm in diameter) (**Fig. 1, 2C**), versus disc shaped seeds (0.4–0.8 mm in diameter) that are 2–3 times wider than thick (Taylor 1989: fig. 194, p. 640).

***Conservation status*:** After a search along the circumference of the type locality swamp (**Fig. 3**), plants were not observed anywhere else. Two nearby swamps (*c.* 10 and 15 km away respectively) were also examined with no other sightings.

Considering the limited geographic distribution of *Utricularia corneliana* and its low frequency at the collection site, it is likely that this plant is extremely rare. The collection site is on leasehold land and is therefore not protected.

If *Utricularia corneliana* is more widespread than appears, the question remains as to why it had not been collected before this study? One possible answer is that the flowers of *U. corneliana* resemble those of other local *Utricularia* species (*U. aurea*, *U. gibba*, and *U. stellaris*) in the general shape and colour (yellow), blending in with these more common species.

It could also be the case that habitat destruction, erosion, weed infestation, and associated eutrophication of swamps and lagoons, early on in the agricultural history of the region, has reduced the population size of *Utricularia corneliana*. An example of a local disappearance of a fellow suspended aquatic species is that of *U. tubulata* F.Muell., the type specimen of which (*Armit 222* [MEL1513562]) was collected in 1875 on 'Cashmere' (now 'Glen Ruth' and 'Goshen' stations), about 15 km E of the *U. corneliana* site. Armit recorded the plant as "floating in swamps and lagoons" on "Cashmere", but it has not since been collected anywhere in Queensland, except for a single site in the far north-west corner of the state (*Jacobs 1465* [NSW]).

A more intensive survey of this area of Queensland is warranted to determine presence and extent of both the above species; although it is likely that *Utricularia corneliana* has mostly suffered the same early fate as that of the local *U. tubulata*. At present the conservation status of *U. corneliana* should be regarded as Data Deficient.

***Etymology*:** The specific epithet is in honour of Cornelia M. Jobson, the author's wife and field assistant.

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Key to Australian and related suspended aquatic species of *Utricularia* (modified from Taylor 1989)

Abbreviations: NSW (New South Wales), Qld (Queensland), NT (Northern Territory), SA (South Australia), Tas (Tasmania), WA (Western Australia)

1 Leaves verticillate; peduncle inflated; corolla very pale pink with a very slender spur 1.5–2 cm long . . . . . **U. tubulata** (Qld, NT, WA)
1. Leaves not verticillate (some semiverticillate); peduncle not inflated; corolla yellow. **2**

2 Peduncle with whorl of usually inflated leaf-like structures at or above base; primary segments of leaves 3–6 . . . . . **3**
2. Peduncle without a whorl of inflated leaf-like organs; primary segments of leaves 2 . . . . . **5**

3 Inflated leaf-like organs fusiform, arising from base, or near base of peduncle . . . . . **U. aurea** (NSW, Qld, NT, WA)
3. Inflated leaf-like organs ellipsoid, arising some distance above base of peduncle **4**

4 Inflated leaf-like organs sessile with capillary segments arising from distal half only; seeds disk shaped, angular (not winged); calyx about equal in length to capsule . . . . . **U. stellaris** (NSW, Qld, NT, WA)
4. Inflated leaf-like organs stipitate with capillary segments arising from distal half and from base; seeds lenticular, narrowly winged; calyx much shorter than capsule . . . . . **U. muelleri** (Qld, NT, WA)

5 Corolla externally pubescent; traps always inserted at angle between leaf segments **6**
5. Corolla externally glabrous; traps lateral on leaf segments **7**

6 Corolla upper lip longer than lower; seed flat, lenticular . . . . . **U. corneliana** (Qld)
6. Corolla upper lip equal to or shorter than lower; seed thick, disk-shaped . . . . . **U. reflexa** (tropical Africa, Madagascar)

7 Leaves with ultimate segments few (2–8); upper corolla lip larger than lower . . . . . **U. gibba** (All states except SA, Tas)
7. Leaves with ultimate segments numerous (20–80); upper corolla lip smaller than lower . . . . . **U. australis** (All states)

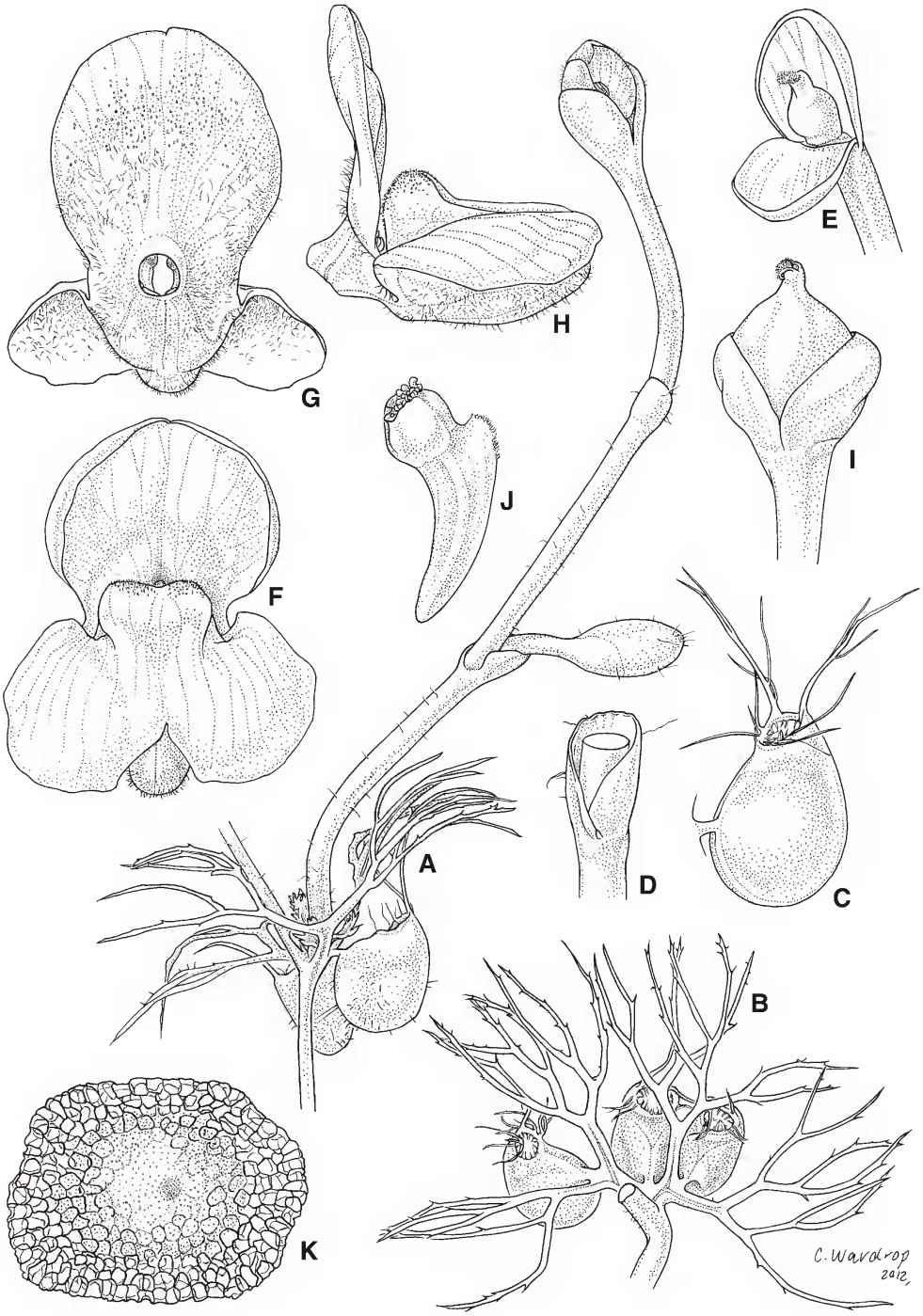

Fig. 1. ***Utricularia corneliana.*** A. habit ×5.5. B. leaf segments with traps ×7. C. bladder-trap in lateral view ×10. D. bract with pedicel base *in situ* ×10. E. sepals with exposed ovary ×7. F. flower in frontal view ×5.5. G. flower in rear view ×5.5. H. flower in lateral view ×5.5. I. fruiting capsule with calyx ×7. J. stamen ×20. K. seed ×40. A–K from *Jobson 1281* (NSW).

Fig. 2. ***Utricularia corneliana.*** A. habit. B. Internal quadrifid gland of bladder trap. C. flat lenticular seed. A–C from *Jobson 1281* (NSW).

Fig. 3. Shallow swamp habitat holding the observed population of *Utricularia corneliana*. Insert is a topographic map of northern Queensland showing vicinity of collection site (red box).

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